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U.S. Department of the Interior • U.S. Geological Survey

# MINERAL INDUSTRY SURVEYS

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## TIN IN NOVEMBER 1996

Domestic consumption of primary tin in November was estimated by the U.S. Geological Survey (USGS) to be slightly lower than in October 1996 and slightly lower than in November 1995.

The *Platt's Metals Week* composite price for tin was \$4.01 per pound; slightly higher than in October, 6% lower than in November 1995.

In Wheeling, WV, Wheeling-Pittsburgh Steel Corp. announced that a strike by the United Steelworkers Union that started October 1 continued through the end of November, with no end in sight. Wheeling is one of several domestic tinplate producers and ranks as a major domestic user of tin.<sup>1</sup>

In Portland, OR, it was reported that the impending purchase of Proler International Corp. by Schnitzer Steel Industries Co. continued to gain momentum with the announcement that the Federal Government had given anti-trust clearance for the acquisition. Earlier, scrap dealer Hugo Neu Co. had also made a bid to purchase Proler. Proler is an important domestic detinner, with detinning facilities in Coolidge, AZ, and Seattle, WA.<sup>2</sup>

In Jakarta, Indonesia, P.T. Tambang Timah announced that it was on schedule to commission a new furnace at its Bangka Island tin smelter by yearend. The new furnace was designed and built locally, and could potentially boost the firm's annual production of tin metal to 50,000 metric tons. Timah announced that it was no longer toll smelting and was focusing on processing its own high-grade tin concentrates, which Timah maintained were consistently at least 74% tin content. Timah employs a total workforce of 5,500 people, of which 150 work at its Bangka Island tin smelter. Timah produced 37,000 tons of tin metal in 1995, and is on target to produce 41,000 tons of tin metal in 1996, with the aim of increasing output to 47,000 tons of tin metal by 1997. In order to meet this increase in tin metal production, Timah is developing two new dredger operations at its mines, which are mostly situated on the Rhio

Islands near Singapore, from where the tin concentrate is then transported by barge to the smelter. Timah operates 21 dredgers and plans to add another two dredgers, which are set to start in 1998 and 1999, respectively. Timah exports 95% of its tin, with the majority being shipped to Asian customers. Timah plans to eventually move more into the production of higher grade low-lead tin. It is now conducting a pilot operation, working on developing an electrolytic process that could be used to increase the firm's production of 99.99% tin. Timah currently produces 99.85% tin mostly, but it also produces some 99.93% tin with a particularly low lead content.<sup>3</sup>

In Tokyo, Japan, it was announced that Nippon Steel won a contract to construct a dual tinplate and tin-free steel plating line for Dongbu Steel Corp. of South Korea at its new Asan Bay works, southwest of Seoul. Start-up was expected by mid-1998. The new line would give Dongbu a combined tinplate and tin-free-steel capacity of 380,000 tons annually when combined with the existing facilities at its Incheon Works. The contract is Nippon Steel's first for a tinplate plant in South Korea, although Nippon has constructed similar facilities elsewhere, as for Siam Tinplate in Thailand and for Guangzhou Pacific Tinplate in China. Nippon expected to begin trials by yearend 1996 on the 120,000-ton-per-year plating line now under construction at Guangzhou. Guangzhou Pacific Tinplate is held 25% by Nippon Steel, 20% each by Mitsui and Co. and Nissho Iwai, and the balance by Chinese and Hong Kong concerns. But unlike the planned Dongbu line, the Guangzhou line cannot produce tin-free steel. China's tinplate demand is reported to have exceeded 750,000 tons in 1995 and is growing 10% annually.<sup>4,5</sup>

In Paris, France, APEAL (The Association of European Producers of Packaging Steel) announced the progress of tinplate in Europe's aerosol can market. World production of aerosol cans has been increasing since 1992, with the most consistent growth being recorded in Europe. In 1995, European

aerosol can production was 3.8 billion units, representing a 5% increase over 1994, and an 18% increase over 1992. By the year 2000, it was expected that tinplate would have an 80% share of this expanding market. In world aerosol production, which amounted to 8.6 billion units in 1995, Europe claimed the lion's share with 44%, compared to 35% for the United States, and 8% for Japan. In Europe, the most significant growth has been recorded in the United Kingdom (UK), where production increased by 20%, from 1.0 billion units in 1994 to 1.2 billion units in 1995. Now, the UK accounts for 33% of European aerosol production. In the aerosol sector, steel is consolidating its domination against rival materials such as aluminum and glass. In Europe, its market share grew from 65% in 1994 to 70% in 1995. In the UK, the largest European producer, 66% of aerosols are steel, with 30% being aluminum and 4% glass. In the United States, steel controls 80% of the aerosol market.

APEAL attributes this success to a number of items:

- a) Economic advantage in the form of a relatively stable price of steel.
- b) Environmental advantage, since steel aerosols can be easily extracted from household trash via electromagnets for recycling.
- c) Film-coated steel is often used for the production of aerosol domes and cones. It has attractive appearance and high resistance to rust.
- d) The development of the 2-piece steel aerosol can, made with technology borrowed from the steel can drawing and ironing process applied to drink cans, is about 40% lighter than a 3-piece can of the same capacity. Such a major savings in the amount of steel used has been achieved by using today's high-ductility grades of steel. It has been possible to reduce the thickness of the walls of the can by almost 50% without loss of the can's rigidity. Also, the external appearance has been enforced by the removal of the traditional weld seam and the can is now able to be compressed after use.<sup>6</sup>

In Zimbabwe, it was reported that the Kamativi Tin Mine could be re-started if negotiations between a group of local investors, Allied Mining Investment, and the Zimbabwe Mining Development Corp. (ZMDC) come to a successful conclusion. The mine was closed by the ZMDC in 1994.<sup>7</sup>

Reports from Southeast Asia indicate that tin smelting treatment charges are rising, driven by increased labor and utility costs in countries such as Malaysia and Thailand. Smelting treatment charges are rarely mentioned in print, so these reports shed light on a rarely discussed topic. The majority of tin concentrate being smelted in Southeast Asia is in the 40-60% tin range, with treatment charges leveled at around \$500-\$550 per ton. Charges for the higher grades, such as 60-70% and 70-75%, stand at \$350-\$400 and \$330-\$380 per ton, respectively. Treatment charges can vary greatly depending on location and quantity to be treated. Reportedly, in some locales, charges can be as high as \$700 per ton.<sup>8</sup>

In Paris, France, it was reported that two large European packaging firms have agreed to merge their metal packaging operations and sell 60% of the merged operation to a British investment firm. French-based Pechiney agreed to merge its food can, general line, and steel aerosol can businesses with Schmalbach Lubeca AG/Continental Can Europe, a subsidiary of Viag AG of Germany. By combining Pechiney's 19 production plants and Schmalbach's 16 production plants, a major European producer with annual sales of \$1.40 billion would be created. The second part of the proposed merger is for British-based Doughty Hanson and Co. to acquire a 60% stake in the new organization, with Pechiney and Schmalbach each retaining a 20% interest. Currently, Schmalbach's metal packaging division has a work force of 4,700 people and Pechiney's can operations have 3,200 people.<sup>9</sup>

In Storrs, CT, researchers at the University of Connecticut announced development of a way to deal with the problem that some recycling of tin cans used as food containers is inefficient because the enamel on the can masks nearly 50% of the tin. Observing that tin cans of all types represent an abundant source of steel scrap, with some 100 million containers used and discarded daily, the researchers noted that proper detinning was crucial because a tin content of 0.35% could make steel brittle and less ductile. Tin content should be reduced via proper detinning to a level of 0.06% by weight. They noted that by using higher temperatures and higher concentrations of potassium stannate in the detinning of post-consumer cans, they found they could meet optimal levels of enamel removal via electrochemical methods. They described an alkaline electrochemical process that treats tin cans as anodes and selectively removes tin without dissolving steel.<sup>10</sup>

## Update

On January 17, 1997, the *Platt's Metals Week* composite price for tin was \$4.01 per pound.

<sup>1</sup>Metal Bulletin. In Brief. No. 8131, Nov. 21, 1996, p. 23.

<sup>2</sup>\_\_\_\_\_. Schnitzer-Proler Deal Gets Anti-Trust Clearance. No. 8133, Nov. 28, 1996, p. 9.

<sup>3</sup>\_\_\_\_\_. Timah Moves To Increase Capacity. No. 8130, Nov. 18, 1996, p. 11.

<sup>4</sup>\_\_\_\_\_. Dongbu Plans Expansion In Tinplate. No. 8131, Nov. 21, 1996, p. 23.

<sup>5</sup>\_\_\_\_\_. Hotline: Developments at Asan Bay. No. 8132, Nov. 25, 1996, p. 14.

<sup>6</sup>Press Release from APEAL, Brussels, Belgium.

<sup>7</sup>Metal Bulletin. Hotline: Zimbabwe Tin Restart? No. 8129, Nov. 14, 1996, p. 16.

<sup>8</sup>\_\_\_\_\_. SE Asian Smelting Charges Pushed Up By higher Costs. No. 8129, Nov. 14, 1996, p. 5.

<sup>9</sup>American Metal Market. Pechiney, Schmalbach Merge Packaging Units. V. 104, No. 227, Nov. 21, 1996, p. 12.

<sup>10</sup>\_\_\_\_\_. Tin Can Recycling Problem Tackled. V. 104, No. 228, Nov. 22, 1996, p. 7.

TABLE 1  
SALIENT TIN STATISTICS 1/

(Metric tons, unless otherwise noted)

	1995 p/	1996		
		October	November	January- November
Production, secondary e/ 2/	10,800	900	900	9,900
Consumption:				
Primary	34,400	2930 r/	2,870	33,100
Secondary	10,400	849 r/	828	9,420
Imports for consumption, metal	33,200	2,460	NA	NA
Exports, metal	2,790	356	NA	NA
Stocks at end of period	4,580	4,810 r/	6,810	XX
Prices (average cents per pound): 3/				
Metals Week composite 4/	415.61	400.25	401.00	XX
Metals Week New York dealer	294.54	277.72	279.14	XX
London, standard grade, cash	282.00	269.00	271.00	XX
Kuala Lumpur	277.59	267.32	267.00	XX

e/ Estimated. p/ Preliminary. r/ Revised. NA Not available. XX Not applicable.

1/ Data are rounded to three significant digits, except prices.

2/ Comprises tin recovered from alloys and tinplate. The detinning of tinplate (coated steel) yields only a small part of the total.

3/ From Platt's Metals Week.

4/ The Metals Week composite price is a calculated formula, not a market price, that includes fixed charges, finance charges, and a risk factor. It normally is substantially higher than other tin prices.

TABLE 2  
METALS WEEK COMPOSITE PRICE

(Cents per pound)

Period	High	Low	Average 1/
1995 (annual)	473.30	360.15	415.61
1995:			
November	427.16	419.31	425.35
December	427.10	416.42	419.75
1996:			
January	423.56	415.24	418.59
February	417.70	411.89	415.55
March	427.03	405.03	414.71
April	435.05	422.96	429.61
May	436.25	415.30	426.88
June	418.01	410.83	413.65
July	423.04	408.27	417.03
August	411.84	407.75	409.11
September	413.10	402.69	408.04
October	404.38	396.12	400.25
November	409.57	392.40	401.00

1/ The Metals Week composite price is a calculated formula, not a market price, that includes fixed charges, finance charges, and a risk factor. It normally is substantially higher than other tin prices.

Source: Platt's Metals Week.

TABLE 3  
TINPLATE PRODUCTION AND SHIPMENTS IN THE UNITED STATES 1/

(Metric tons, unless otherwise noted)

Period	Tinplate waste (waste, strips, cobble, etc.) (gross weight)	Tinplate (all forms)			Shipments 2/
		Gross weight	Tin content	Tin per metric ton of plate (kilograms)	
1995: p/	205,000	1,660,000	9,600	5.8	2,400,000
1996:					
January	14,200	116,000	729	6.3	179,000
February	16,700	131,000	826	6.3	196,000
March	16,900	144,000	813	5.6	220,000
April	16,100	124,000	790	6.3	202,000
May	16,200	122,000	821	6.7	208,000
June	16,500	137,000	843	6.2	218,000
July	15,700	141,000	857	6.1	231,000
August	14,600	132,000	845	6.4	237,000
September	14,200	133,000	809	6.1	212,000
October	13,000	127,000	793	6.2	213,000
November	14,300	130,000	827	6.3	NA

p/ Preliminary. NA Not available.

1/ Data are rounded to three significant digits.

2/ Shipments data from American Iron and Steel Institute monthly publication AIS10.

TABLE 4  
U.S. TIN IMPORTS FOR CONSUMPTION AND EXPORTS 1/

(Metric tons)

Country or product	1996			
	1995	September	October	January- October
Imports:				
Metal (unwrought tin):				
Bolivia	6,630	436	515	5,430
Brazil	8,070	701	700	7,600
China	5,610	201	89	2,430
India	146	100	203	739
Indonesia	7,230	720	817	6,360
Malaysia	3,810	20	20	955
Russia	149	--	--	435
Other	1,510	178	115	1,060
Total	33,200	2,360	2,460	25,000
Other, (gross weight):				
Alloys	11,400	989	1,120	9,760
Bars and rods	484	63	29	543
Foil, tubes, and pipes	16	--	--	(2/)
Plates, sheets, and strip	468	1	1	632
Powders and flakes	37	--	--	--
Waste and scrap	15,900	511	209	6,460
Miscellaneous	1,470	137	154	1,050
Total	29,800	1,700	1,510	18,400
Exports (metal)	2,790	340	356	3,740

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5  
CONSUMPTION OF TIN IN THE UNITED STATES, BY FINISHED PRODUCT 1/

(Metric tons of contained tin)

Product	1996							January- November total
	1995 p	October			November			
		Primary	Secondary	Total	Primary	Secondary	Total	
Alloys (miscellaneous) 2/	W	32	W	32	34	W	34	66
Babbitt	254	20 r/	W	20 r/	20	W	20	222
Bar tin and anodes	77	9	--	9	W	--	W	70
Bronze and brass	1,940	77	90	167	71	90	161	1,710
Chemicals	W	280	--	280	293	--	293	573
Collapsible tubes and foil	W	W	--	W	W	W	--	W
Solder	9,470	580 r/	235 r/	815 r/	498	219	717	8,220
Tinning	689	141	--	141	133	--	133	1,510
Tinplate 3/	9,610	793	W	793	827	W	827	8,950
Tin powder	159	W	--	W	W	W	W	291
White metal 4/	W	W	--	W	W	W	W	8
Other	6,680	101 r/	24	125 r/	97	19	116	5,560
Total reported	28,900	2,030 r/	349 r/	2,380 r/	1,970	328	2,300	27,200
Estimated undistributed consumption 5/	15,900	900	500	1,400	900	500	1,400	15,400
Total	44,800	2,930 r/	849 r/	3,780 r/	2,870	828	3,700	42,600

p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includesterne metal.

3/ Includes secondary pig tin and tin acquired in chemicals.

4/ Includes pewter, britannia metal, and jewelers' metal.

5/ Estimated consumption of plants reporting on an annual basis.

TABLE 6  
DEFENSE LOGISTICS AGENCY  
TIN STOCKPILE DISPOSALS 1/

(Metric tons)

Period	Monthly disposals
1995:	
November	20
December	15
Year total	955
1996:	
January	90
February	450
March	534
April	5
May	10
June	330
July	1,180
August	1,370
September	2,300
October	--
November	210
Total	6,470

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ These disposals represent only the daily, spot sales program. They do not include the long-term dealer contract sales program.

Source: Defense Logistics Agency.